

AD-A273 258



The US Army's Center for Strategy and Force Evaluation

**STUDY REPORT
CAA-SR-93-4**

2

**THE COMPONENT REQUIREMENTS AND
AUTHORIZATION DETERMINATION
STUDY (COMRAD)**

DTIC
ELECTE
NOV 30 1993
S A

MAY 1993



**PREPARED BY
FORCE EVALUATION DIRECTORATE**

**US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814-2797**

This document has been approved
for public release and sale; its
distribution is unlimited.

93 11 0 105

390 93-27489

996



DISCLAIMER

The findings of this report are not to be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation. Comments or suggestions should be addressed to:

**Director
US Army Concepts Analysis Agency
ATTN: CSCA-FE
8120 Woodmont Avenue
Bethesda, MD 20814-2797**

REPORT DOCUMENTATION PAGE			Form Approved OPM No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources gathering and maintaining the data needed, and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.				
1. AGENCY USE ONLY (Leave Blank)		2. REPORT DATE May 1993		3. REPORT TYPE AND DATES COVERED Final No: 91 - May 93
4. TITLE AND SUBTITLE The Component Requirements and Authorization Determination Study (COMRAD)			5. FUNDING NUMBERS N/A	
6. AUTHOR(S) LTC Francis T. Julia, Jr.				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army Concepts Analysis Agency, Bethesda, MD 20814-2797			8. PERFORMING ORGANIZATION REPORT NUMBER CAA-SR-93-4	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA, MRA), Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A	
11. SUPPLEMENTARY NOTES N/A				
12a. DISTRIBUTION/AVAILABILITY STATEMENT			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The COMRAD Study sponsors requested CAA develop a methodology to make the Army force component allocation process more objective. The study developed, tested, and demonstrated a methodology for allocating force structure requirements into components (Active/Reserve) using the time-phased force requirements output of the Force Analysis Simulation of Theater Administrative and Logistic Support (FASTALS) Model as the principal input. The study identified key factors which impact on the component allocation process, e.g., unit availability, crisis response, forward presence, etc., and incorporated, where possible, those factors in to the methodology. The methodology was tested using a microcomputer-based relational data base program and selected Total Army Analysis - 2001 (TAA-01) parameters. Application of the methodology provides a potential starting point which can assist force integration officers during the resourcing phase of the TAA process. The POC for further information is LTC Francis T. Julia, Jr., DSN 295- 0570 1625				
14. SUBJECT TERMS Active Component, Reserve Component, Reserves, force requirements, AC/RC mix, force resourcing			15. NUMBER OF PAGES 43	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	

STUDY REPORT
CAA-SR-93-4

THE COMPONENT REQUIREMENTS AND AUTHORIZATION
DETERMINATION STUDY (COMRAD)

DTIC QUALITY INSPECTED 8

May 1993

Accession For	
NTIS CRASH	
DTIC 1-6	
Unannounced	
Justification	
By <i>Per call</i>	
Distribution	
Availability	
Dist	Availability Special
A-1	

Prepared by

FORCE EVALUATION DIRECTORATE
LTC Francis T. Julia, Jr.

US Army Concepts Analysis Agency
8120 Woodmont Avenue
Bethesda, Maryland 20814-2797

REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
US ARMY CONCEPTS ANALYSIS AGENCY
8120 WOODMONT AVENUE
BETHESDA, MARYLAND 20814-2797



CSCA-FER/S (5-5d)

1 OCT 1993

MEMORANDUM FOR

Assistant Secretary of the Army, Manpower and Reserve Affairs, ATTN: SAMR-
ZB, Washington, DC 20310
Deputy Chief of Staff for Operations and Plans, ATTN: DAMO-FDF, Washington,
DC 20310-0544

**SUBJECT: Component Requirements and Authorization Determination Study
(COMRAD)**

1. Reference memorandum, DAMO-FD, 20 May 92, subject: COMRAD Study Directive.
2. Referenced memorandum requested that the U.S. Army Concepts Analysis Agency (CAA) develop a methodology to make the Army force structure component allocation process more objective.
3. This final report documents the results of our analyses and incorporates your comments on the draft report. Included is an executive summary which provides an overview of the entire study. Questions and/or inquiries should be directed to the Assistant Director, Force Evaluation Directorate, U.S. Army Concepts Analysis Agency, 8120 Woodmont Avenue, Bethesda, MD 20814-2797, DSN 295-1677.
4. I would like to express my appreciation to all staff elements and agencies which have contributed to this study.

E. B. VANDIVER III
Director



**THE COMPONENT REQUIREMENTS
AND AUTHORIZATION
DETERMINATION STUDY (COMRAD)**

**STUDY
SUMMARY
CAA-SR-93-4**

THE REASON FOR PERFORMING THE STUDY. The Component Requirements and Authorization Determination Study (COMRAD) sought to develop a quantitative methodology to assist in allocating the Army's force structure requirements developed in the Total Army Analysis (TAA) process into the various force components (Active, Army National Guard, US Army Reserve, etc.).

THE STUDY SPONSORS are the Assistant Secretary of the Army (Manpower and Reserve Affairs) and the Assistant Deputy Chief of Staff for Operations and Plans, Force Development.

THE STUDY OBJECTIVE. Develop, test, document, and demonstrate a quantitative methodology which recommends whether a required unit should be resourced in the Active or Reserve Component.

THE SCOPE OF THE STUDY. Examine the total Army (active and reserve) table of organization and equipment (TOE) structure for the combat support and combat service support structure (below-the-line forces). Test the methodology against the TAA-01 generated structure.

THE MAIN ASSUMPTION. There will be no change to the way that force structure requirements are determined as part of the TAA process. The Army end strength and number of divisions, separate brigades, and corps will be defined by the study sponsors.

THE BASIC APPROACHES used in this study were to:

(1) Develop a Force Structure Resourcing Methodology (FSRM) around the time phased force requirements produced by the Support Requirements Analysis (SRA) study.

(2) Identify factors that should be considered in the FSRM and determine how to incorporate them into the FSRM by way of quantitative assessments or decision rules.

(3) Identify any essential items involved in the process for force structure resourcing.

THE PRINCIPAL FINDINGS of the work reported herein are as follows:

(1) It is difficult or impossible to quantify every factor of force structure resourcing. Subjective comparisons between theater needs, unit contributions, and unit potential must remain part of the TAA process. Deterrence and traditional state missions are examples of such factors.

(2) Several factors emerged as critical to the force structure resourcing problem: affordability, capability, crisis response, deployability, forward presence, unit manning level, multiple missioning, operational priorities, peacetime missions, readiness, rotation base, and trainability. These factors were incorporated into the FSRM.

(3) A flexible, easy to use, microcomputer-based system for allocating (i.e., resourcing) combat support/combat service support (CS/CSS) force structure was possible to develop and found acceptable in demonstrations of the system. The prototype model developed will be used as a basis for future modeling.

(4) Three items--the forces to be allocated (i.e., total requirements), the priority for allocating force structure, and the time required for active/reserve units to deploy to combat--are essential to the resourcing process.

THE STUDY EFFORT was directed by LTC Francis T. Julia, Jr., Force Evaluation Directorate.

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-FE, 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797.

CONTENTS

CHAPTER		Page
1	EXECUTIVE SUMMARY	1-1
	Purpose	1-1
	Background	1-1
	Objective	1-2
	Scope	1-2
	Assumptions	1-3
	Limitations	1-3
	Essential Elements of Analysis	1-3
	Methodology	1-4
	Findings	1-4
	Observation	1-4
	Summary	1-4
2	METHODOLOGY	2-1
	Introduction	2-1
	Critical Resource Decision Factors	2-1
	Force Structure Resource Methodology	2-2
	Input Files	2-3
	COMRAD Model Decision Flow	2-4
	Output	2-5
	Alternative Case Production	2-6
	Summary	2-6
3	TESTING THE MODEL	3-1
	Introduction	3-1
	Inputs	3-1
	Base Case	3-1
	Alternative Cases	3-2
	Conclusions	3-2
APPENDIX		
A	Study Contributors	A-1
B	Study Directive	B-1
C	Bibliography	C-1
D	Sample Output	D-1
E	Sponsor's Comments	E-1
F	Distribution	F-1
GLOSSARY		Glossary-1

FIGURES

FIGURE		Page
1-1	TAA Process	1-2
2-1	Time-to-Combat File	2-3
2-2	COMRAD Allocator Decision Flow	2-5

THE COMPONENT REQUIREMENTS AND AUTHORIZATION DETERMINATION STUDY (COMRAD)

CHAPTER 1

EXECUTIVE SUMMARY

1-1. PURPOSE. Produce a more objective process for resourcing the Army's required force structure by component.

1-2. BACKGROUND

a. In May 1992, the Assistant Secretary of the Army for Manpower and Reserve Affairs (ASA, MRA) and Assistant Deputy Chief of Staff for Operations and Plans (ADCSOPS), Force Development (DAMO-FD) requested the US Army Concepts Analysis Agency (CAA) examine the process used to resource the Army's combat support and combat service support force structure. These forces are usually referred to as the below-the-line forces. The combat forces are determined and resourced through a different process which this study does not address. The sponsors sought to improve the process of force resourcing by incorporating more objective and quantifiable elements into what had historically been a mostly subjective process.

b. The cosponsors were not interested in major changes in the existing process. Rather, they sought a tool which would improve the efficiency of the process and aid in their force structure development efforts.

c. The Army uses a four-phase process to determine and allocate its required force structure. This study does not examine either the first phase, force guidance, or the fourth phase, leadership review. It is interested in the output of the second phase, determining the requirements for types of units. It is concerned with the third phase, resourcing the force by component (COMPO), which is largely nonquantitative, using negotiations or tradeoffs to allocate units to the different components. It is primarily concerned with resourcing the combat support and combat service support structure. The resourcing of these requirements is the focus of this study. See Figure 1-1.

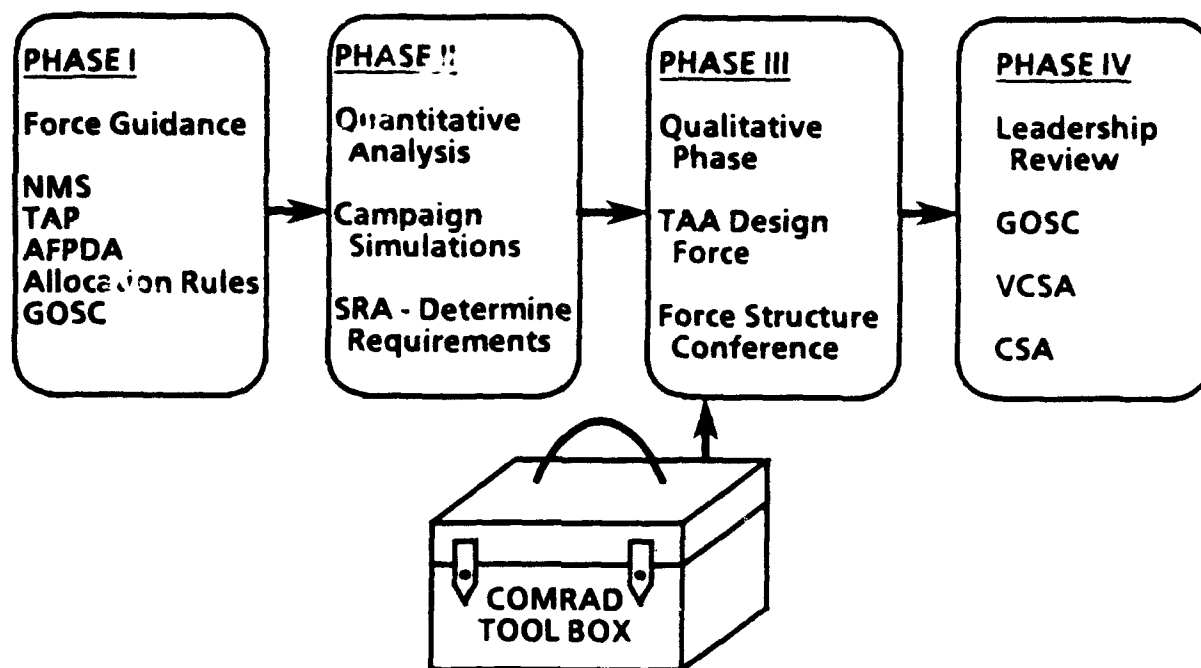


Figure 1-1. TAA Process

1-3. OBJECTIVE. Develop, test, document, and demonstrate a quantitative methodology which determines the preferred COMPOs for required force structure.

1-4. SCOPE

a. Examine the total Army (active and reserve) table of organization and equipment (TOE) structure for the combat support and combat service support forces (below-the-line forces). Test and demonstrate the methodology. Initially, the plan was to test the methodology using the Program Objective Memorandum (POM) 1999 force structure. The sponsors changed this to a testing of the Total Army Analysis - 2001 (TAA-01) force structure.

b. The Army's structure is composed of nine components:

COMPO 1 - Active	COMPO 6 - (POMCUS)
COMPO 2 - ARNG	COMPO 7 - (WHNSD)
COMPO 3 - USAR	COMPO 8 - (WHNSI)
COMPO 4 - Not resourced	COMPO 9 - (LOGCAP)
COMPO 5 - Units not matched to requirements	

Army components 2 (Army National Guard (ARNG)) and 3 (United States Army Reserve (USAR)) will be combined during allocation into a Reserve Component

group. With the exception of COMPO 4 (unresourced requirements), all other components will be fixed inputs to the developed model.

c. The study's concentration on the Army's support forces was always the sponsors' intent; however, the study directive did not clearly make this distinction. The combat force structure of the Army is determined through other force design processes and is used as an input to the support force requirements determination process.

1-5. ASSUMPTIONS. There will be no change to the way that force structure requirements are determined as part of the TAA process. The Army end strength and number of divisions, separate brigades, and corps will be defined by the study sponsors.

1-6. LIMITATIONS. There is no attempt to distribute the Reserve Component units between the ARNG and the USAR.

1-7. ESSENTIAL ELEMENTS OF ANALYSIS

a. Identify critical resourcing factors which should be used by the methodology.

(1) The factors identified were:

Affordability	Capability
Crisis response	Deployability
Deterrence	Forward presence
Multiple missioning	Operational priorities
Peacetime missions	Readiness
Reconstitution	Rotation base
Trainability	Unit manning level

(2) Three factors--deterrence, peacetime missions, and reconstitution--were not incorporated into the methodology as they could not be quantified in a meaningful way.

b. How can these factors be quantified and integrated into the methodology?

(1) The methodology developed uses microcomputer executable programs which operate on dBase III Plus files.

(2) Forward presence, unit manning level, and affordability relate directly to counting. The methodology creates input files reflecting the numbers developed for these factors which are then queried during the model execution.

(3) The remaining factors are incorporated through a combination of objective/subjective assessments which "count" their impact. These impacts are captured in additional input files, specifically: Mandated Force Structure File, Time-to-Combat File, and Priority File.

c. Does the methodology provide a reasonable allocation of requirements between the Active/Reserve Components and does it provide for useful alternative case analysis?

(1) Tested against the actual requirements from TAA-01, the model used "approved for testing" inputs to produce an AC/RC allocation. This output was accepted as a reasonable one by the study sponsors and, further, offered a new tool to be used in the future.

(2) Testing of alternative cases proved easy and responsive.

1-8. METHODOLOGY. Force structure resourcing was developed around the time-phased force requirements produced through the Force Analysis Simulation of Theater Administrative and Logistic Support (FASTALS) Model. Critical force structure resourcing factors were identified and quantified as input files or incorporated into decision rules. A computer program model was developed which used the files and rules to allocated force requirements between the Active and Reserve Components. Figure 2-2, Chapter 2, shows the methodology's decision flow.

1-9. FINDINGS

a. It is difficult or impossible to quantify every factor of force structure resourcing. Subjective comparisons between theater needs, unit contributions, and unit potential must remain part of the TAA process. Deterrence and traditional state missions are examples of such factors.

b. Several factors emerged as critical to the force structure resourcing problem: affordability, capability, crisis response, deployability, forward presence, unit manning level, multiple missioning, operational priorities, peacetime missions, readiness, rotation base, and trainability. These factors were incorporated into the FSRM.

c. A flexible, easy to use, microcomputer-based system for allocating (i.e., resourcing) combat support/combat service support (CS/CSS) force structure was possible to develop and found acceptable in demonstrations of the system. The prototype model developed will be used as a basis for future modeling.

d. Three items--the forces to be allocated (i.e., total requirements), the priority for allocating force structure, and the time required for active/reserve units to deploy to combat--are essential to the resourcing process.

1-10. OBSERVATION. The COMRAD methodology incorporates critical resourcing factors into its operation. The dynamics of the Army force structure process dictate that all of these factors must be constantly reexamined and reassessed for any application. As changes occur in how these factors affect the resourcing process, the model will have to adapt and reflect these changes as well.

1-11. SUMMARY. The COMRAD Model provides a useful tool to assist the force structure developers within the Army. As with all tools, it must be used carefully. It cannot and does not provide "the correct answer." It can and does offer a valid starting point in the search for "the correct answer."

CHAPTER 2

METHODOLOGY

2-1. INTRODUCTION. Initially, critical resourcing decision factors were identified and a determination made as to those which could be quantified in some fashion. A microcomputer-based force structure resource methodology (FSRM) was developed which used the quantified data and generated a mix of active/reserve force structure.

2-2. CRITICAL RESOURCE DECISION FACTORS

a. A careful examination of the literature dealing with the problem of Active/Reserve Component mix and discussions with key components of the Army Staff and major commands identified a relatively short list of factors which have impact on the allocation process:

Affordability	Capability
Crisis response	Deployability
Deterrence	Forward presence
Multiple missioning	Operational priorities
Peacetime missions	Readiness
Reconstitution	Rotation base
Trainability	Unit manning level

b. All of these factors cannot be quantified in a way which allows for a valid incorporation into the allocation methodology. What is the value of one or two or three reserve quartermaster supply units toward deterrence? The only way to incorporate this kind of factor into the model would be to make some assumptions about this factor. Unfortunately, any worthwhile assumption simplifies too much, and one cannot gain any useful insights. Other factors--reconstitution, and peacetime missions--fall outside the scope of the study. Reconstitution is of interest when analyzing long-term conflicts only. The decisions as to which units are assigned against peacetime missions within the individual states are too dependent upon subjective considerations to be incorporated here.

c. The factors of forward presence, unit manning level, and affordability are inherently quantifiable; they are the number of something, i.e., units, people, or dollars. Various input files are created which capture the values to compare to or count against.

d. The other factors can also be quantified but in a more indirect way. Using a combination of objective/subjective assessments on how to "count" these factors, three input files are built. The files are called the Mandated Force Structure File, referring to units required to be resourced in either the Active or Reserve Component; the Time-to-Combat File, referring to how quickly reserve units can be deployed to a conflict; and the Priority File, which provides the priority for allocating the force structure.

e. The quantified factors are now ready to be used by the methodology. However, the dynamics of the Army force structure process dictate that all of these factors must be constantly reexamined and reassessed. Thus, the specific values associated with or to any individual factor must be periodically updated and adjustments made to how it is used in the methodology.

2-3. FORCE STRUCTURE RESOURCE METHODOLOGY

a. The construction of the FSRM began with the decision to link it to the way that the force structure requirements are generated. These requirements are determined by using theater scenarios outlined in the Defense Planning Guidance (DPG), conducting campaign analyses, and then determining the support requirements needed. The requirements used by the FSRM are produced through the use of the Concepts Evaluation Model (CEM), which conducts the theater-level combat, and the FASTALS Model, which counts the requirements based upon the theater campaign. These requirements are identified in a special way. They are time-phased, i.e., accumulated in discrete time periods that are directly related to the scenario timeline. Thus there is a recognition of when each specific requirement is needed. The FSRM takes advantage of this time-phasing to initially prioritize the requirements by when they are needed. Historically, resourcing decisions have depended strongly on whether units arrive early or late.

b. The FSRM further refined the prioritization by differentiating between units which are needed at the same time. This was accomplished by linking each requirement to not only when it is needed but also where on the "battlefield" (from the communications zone (COMMZ) to the forward line of own troops (FLOT)) it is needed and to whom it provides support (division, corps, or theater). The final result is the list of requirements in priority order for resourcing.

c. In order to complete the resourcing process, some identification must be made as to the time difference in having Reserve Component units used to meet a requirement compared to an active unit. In general, reserve units are not able to be deployed as quickly as active units. The RC unit must be placed into federal service (a political decision), its personnel must transition from civilian jobs to military units, and the unit and its personnel must be validated for mission performance before being deployed. The FSRM uses the Time-to-Combat File to identify the time required for each specific unit type to be deployed to any of the scenario's theaters of interest. See Figure 2-1.

SRC	Movement to mobilization station	Validation	Shipment to theater	Move to assembly area	Total
All times are in days.					
Movement to mobilization station is the time required for a unit to move to its mobilization site once it has been alerted or notified for federal service (reserve units).					
Validation is the time needed to verify that a unit is ready to perform its combat mission as well as perform various administrative and medical predeployment activities.					
Shipment to theater is the time needed to ship equipment and personnel to the desired theater and reflects the shipping of equipment before or after the personnel depart.					
Move to assembly area is the time needed to move from the port of debarkation in theater to the location from which it will begin its combat mission.					
Total is the sum of all other categories and is the number which identifies the time required for each specific unit time to be deployed to any theater.					

Figure 2-1. Time-to-Combat File

d. In the end, an FSRM was constructed which acknowledged the priority order for resourcing requirements, the differences in deploying active and reserve units, and quantified the majority of the critical resource decision factors. The methodology was turned into an executable model (the COMRAD Model) by developing relational data base files (dBase III Plus) which address the requirements, constraints, priorities, etc. An executable program was written which produced a recommended mix of active and reserve requirements.

2-4. INPUT FILES. In order to understand how the rules of resourcing are applied, the data files and their structure must be understood. There are seven key data files:

a. The Requirements File is that produced from the output of the FASTALS Model. Each record consists of five fields.

(1) Standard requirement code (SRC) - the unique alphanumeric which identifies each specific unit type in the Army.

(2) Theater - the theater in which a unit is required (as outlined in the DPG).

(3) Day - the specific day, relative to the DPG scenario timeline, the requirement is identified as first being needed.

(4) Region - the geographic region of the battlefield where the unit is located, numbered from 1 - FLOT to 6 - COMMZ.

(5) Purpose - the force level for which the unit provides support or service (division, corps, etc.).

b. The Constraint File summarizes the personnel number limits and is used to count the number of manpower spaces used as the requirements are resourced. It is both an input and output file. The fields that make up this file are:

(1) Active ceiling - total active strength at start.

(2) Active combat - total active strength in combat units (divisions, separate brigades, and armored cavalry regiments).

(3) Active training, transients, holdees, and schools (TTHS) - total active personnel not immediately available for stated reasons.

(4) Active table of distribution and allowances (TDA) - total active strength in non-TOE units.

(5) Active not available - total active forces unable to be deployed to specific theater(s).

(6) Forward-deployed - total active strength deployed forward to each theater.

(7) POMCUS (prepositioning of materiel configured to unit sets) - total active strength matched against units assigned to these equipment packages.

(8) Reserve ceiling, reserve combat, and reserve TDA are defined in the same way as the corresponding active counterpart.

c. The Forward-deployed, POMCUS, Mandated Active, and Mandated Reserve Files have the same structure: SRC, theater - theater employed, number - number available at start, work number - used to count units as they are allocated.

d. The Time-to-Combat File is as described above in Figure 2-1.

2-5. COMRAD MODEL DECISION FLOW. The program developed uses the input files and several decision rules to allocate the requirements into the active/reserve mix. Figure 2-2 portrays this decision flow.

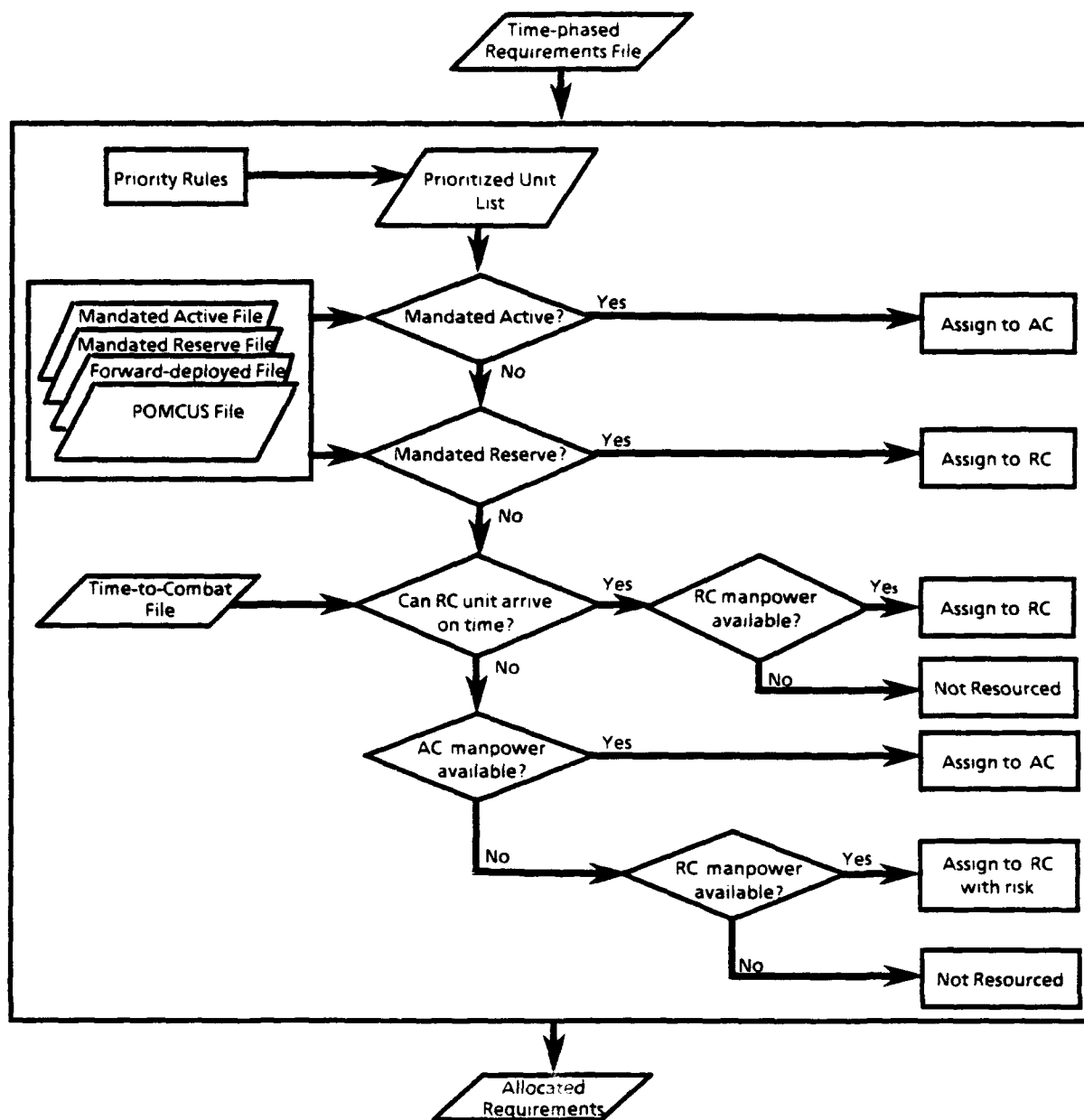


Figure 2-2. COMRAD Allocator Decision Flow

2-6. OUTPUT. Once the allocator has processed a list of requirements, the resulting data base files can be used to generate reports. The standard report is a listing of all requirements grouped by function (aviation, field artillery, medical, etc.) showing the number required and then the number allocated to active, reserve, or not resourced. The reserve category also identifies the risk units (i.e., those requirements allocated

to the reserves but where such reserve units are unable to meet the time-to-combat criterion). See Appendix D for a sample of such output.

2-7. ALTERNATIVE CASE PRODUCTION. The COMRAD Model allows for relatively rapid generation of alternative case runs. Using the efficient and easy methods of data base file editing, alternative values for input constraints and records can be rapidly inserted. The alternative case can then be executed and case results analyzed and compared.

2-8. SUMMARY. The FSRM development process identified critical resourcing factors which influenced the resourcing of force structure. It incorporated these factors into the methodology by quantifying them and/or developing rules to capture their influence. The methodology used the time-phased structure requirements determined by the FASTALS Model. The resulting list was converted into a dBase III Plus file and was linked with several data files that quantify certain resourcing factors (e.g., forward-deployed, manpower constraints, time-to-combat, etc.). A relational data base program was written which, when executed, examined the Requirements File and associated data. A list of requirements allocated to active or reserve is produced. These output files can be produced in several report formats.

CHAPTER 3

TESTING THE MODEL

3-1. INTRODUCTION. Initially, the sponsors wanted the methodology (COMRAD Model) tested against the POM 99 force structure. The inputs would be based upon the decisions made to resource that force. Subsequent to that decision, however, it was decided that the model should be tested against the force structure decisions made during the TAA 2001 process. The impact of this change was that there would be a lack of certain values to use in building the input files, particularly the Time-to-Combat File. In these cases, values would be determined that were reasonable through discussions with the sponsor.

3-2. INPUTS

a. The time-phased Requirements File, Forward-deployed, POMCUS, and Constraint Files were built using the actual values from TAA-01. These values were provided directly from the sponsor and the FASTALS output.

b. The Mandated Active and Mandated Reserve Files were not created wholly from actual data. The sponsor, in conjunction with representatives of US Army Forces Command (FORSCOM) and the National Guard Bureau (NGB) provided information to construct reasonable inputs to use during the testing.

c. The most difficult input file to create proved to be the Time-to-Combat File. There is no single source or even group of sources within the Army which can provide the values to fill this file. Reasonable values can be determined for the movement to mobilization station, shipment to theater, and movement to assembly area (see Figure 2-1). The data for the validation field is elusive or unavailable. The problem arises in trying to determine how long it would take for each unit type within the Army to be determined to be ready to perform its military mission when called up from the reserves. This is true in part because the TAA process is looking at projected units 10 years in the future. Readiness data available describes units in the present. Simply extrapolating to the future is not prudent. Over those 10 years, present units will modernize in equipment, change organization, and perhaps completely change their function to something not envisioned at present. In the end, values were determined through an examination of recent data resulting from the DESERT SHIELD/DESERT STORM operations. This was reasonable for the testing. Future use of the model would require more work in this area.

3-3. BASE CASE. Using the above inputs, a base case run was produced. The model executed correctly, and a recommended allocation of required units between Active/Reserve Components was created. Summarizing the results in total manpower (number of spaces) terms:

Total requirements	Allocated AC	Allocated RC	Risk*	Not resourced
457,176	100,751**	306,478**	72,068	4,699

*Risk spaces are those allocated to RC but which cannot arrive on time as determined from the Time-to-Combat File.

**Requirements allocated at 90 percent of authorized manning per sponsors' input.

These results were examined by the study sponsors and were accepted as being reasonable results given the "for test purposes only" nature of the inputs. Appendix D provides examples of results from model execution.

3-4. ALTERNATIVE CASES. Two alternative case runs were performed to test the model.

a. Alternative 1 (ALT 1) was to have no mandated active units designated. This would provide an additional 62,000 + manpower spaces available within the Active Component for allocation. If the model performed correctly, two things would occur: the numbers allocated to not resourced would decrease, and within the numbers allocated to RC, the risk numbers would decrease as well. Additionally, the mix of units between Active and Reserve Components would change. The results were as predicted.

Case	Total requirements	Allocated AC	Allocated RC	Risk #	Not resourced
Base	457,176	100,751	306,478	72,068	4,699
ALT 1	457,176	103,190	306,473	60,655	1,995

b. Alternative 2 (ALT 2) was to successively modify the Time-to-Combat File by decreasing the total time each unit required to be deployed to the various theaters by 7 days, 14 days, and 21 days. This assessed the impact of changes to validating and/or shipping units where needed. No significant changes in the overall allocation of units or manpower spaces between Active/Reserve Components were expected but the Risk numbers should decrease and/or disappear. Again the expected results occurred and are summarized as:

Case	Total requirements	Allocated AC	Allocated RC	Risk #	Not resourced
Base	457,176	100,751	306,478	72,068	4,699
ALT 2(7 day)	457,176	100,751	306,475	40,111	4,703
ALT 2(14 day)	457,176	100,749	306,477	12,856	4,703
ALT 2(21 day)	457,176	100,751	306,478	0	4,699

3-5. CONCLUSIONS. The testing of the model demonstrated that its execution was consistent; additionally, that alternative cases could be generated and executed easily. Though simplistic, the testing proved that COMRAD could perform as it was designed and desired.

APPENDIX A

STUDY CONTRIBUTORS

1. STUDY TEAM

a. Study Director

LTC Francis T. Julia, Jr., Force Evaluation Directorate

b. Team Members

Mr. Larry Good
Mr. Barry Groves
LTC James Hein
Mr. George Stoll

c. Other Contributors

MAJ Barry V. Brassard
Mr. Charles A. Bruce
MAJ Patrick L. Colbert
Mr. Hugh Devlin
Ms. Nga Do
LTC James O. Kievit
LTC Thomas G. Loggie
Mr. Raymond G. McDowell
Mr. Giles Mills
Ms. Patricia A. Murphy
LTC John M. Nolen
MAJ John Regan

2. PRODUCT REVIEW BOARD

Mr. Ronald J. Iekel, Chairperson
Mr. Robert J. Solomonick
MAJ Carrie B. Williams

3. EXTERNAL CONTRIBUTORS

COL Elwyn L. Brown, FORSCOM
Mr. James Corr, USAFISA
COL Douglas B. Hollenbeck, ARNG
COL David L. McGinnis, ARNG
Mr. Michael J. Moore, DAMO-ZDS
Ms. Molly Warner, DAMO-SSW

APPENDIX B

STUDY DIRECTIVE



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, DC 20310-0400

20 MAY 1992



DAMO-FD (15-1a)

MEMORANDUM FOR DIRECTOR, U.S. ARMY CONCEPTS ANALYSIS AGENCY,
8120 WOODMOUNT AVENUE, BETHESDA, MARYLAND
20814-2797

SUBJECT: Component Requirements and Authorization Determination
(COMRAD) Study

1. PURPOSE OF STUDY DIRECTIVE. This directive establishes objectives and provides guidance to the conduct of the COMRAD study.
2. BACKGROUND. The Army has developed its force structure in a two-step process. The first step, defining the requirement for types of units, has been largely quantitative using various sources to include simulations, doctrine, scenarios, threat and the CINCs' individual theater needs. The second step, largely non-quantitative, used negotiations or tradeoffs to place various units in the different components. A more objective method is desired to perform step two of this process.
3. STUDY SPONSOR AND SPONSOR'S STUDY DIRECTOR. The Assistant Secretary of the Army (Manpower and Reserve Affairs) and The Assistant Chief of Staff for Operations and Plans, Force Development are the co-sponsors of the study and their representatives are Colonel James L. Adams OASA(M&RA) and Colonel Patrick Corcoran, DAMO-FDF.
4. STUDY AGENCY. The U.S. Army Concepts Analysis Agency (CAA).
5. STUDY PURPOSE. Produce a more objective process for resourcing the Army's required force structure by components.
6. OBJECTIVE. Develop, test, and validate a quantitative methodology which will determine the preferred components into which required units are resourced.
7. SCOPE. The study will examine the total Army TO&E structure as organized to achieve operational requirements. The methodology will initially be applied to the POM 99 force structure.
8. ASSUMPTIONS. The number of divisions and corps and total Army end strength is determined by the study sponsor.

DAMO-FD (15-1a)

SUBJECT: Component Requirements and Authorization Determination
(COMRAD) Study

9. LIMITATIONS. The study will not attempt to look at the allocation of elements to either the Active or Reserve component TDA structures.

10. RESPONSIBILITIES.

a. ODCSOPS. Provide input data as required. Coordinate for data with other Army agencies and services. Provide HQDA study executive officer to facilitate study liaison with CAA and steering group members and steering group management.

b. OASA(M&RA). Provide policy oversight; insure study initiatives/proposals are in consonance with Army policy and consistent with legislative spirit and intent.

c. CAA. Guide the structure of the analysis, develop proposed methodology, specify needed data that may be lacking, provide study team, complete, and document the analysis.

11. LITERATURE SEARCH. A thorough literature search was performed and the following six documents of previous work on the subject or related subjects were discovered and subsequently ordered for review.

a. Congressional Research Service Report #89-386 F, U.S. Army Combat-to-Support Ratios: A Framework For Analysis.

b. Congressional Research Service Report #91-763 F, U.S. Army's Roundout Concept After The Persian Gulf War.

c. An Approach to the Army Active/Reserve Force Mix Dilemma for the 1990s and Beyond, by A. L. Austin.

d. The AC/RC Force Mix -- Has the Pendulum Swung Too Far?, by Frederick Wintrich.

e. To Provide an Adequate Defense: a Reserve Component Force Structure for the Year 2000, by Terrance D. Barcellos.

f. The Reserve Component Dilemma: Mission vs Time, by D. B. Skipper.

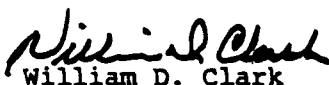
DAMO-FD (15-1a)
SUBJECT: Component Requirements and Authorization Determination
(COMRAD) Study

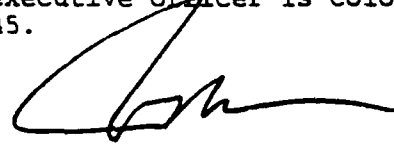
12. REFERENCES.

- a. AR 5-5 The Army Study Program
- b. DA Pam 5-5 Guidance for Army Study Sponsors

13. ADMINISTRATION.

- a. Final results will be presented no later than 1 June 1992.
- b. Coordination. CAA will work directly with ODCSOPS POC, ODCSOPS division chiefs, and other agencies identified by the ODCSOPS POC. ODCSOPS study executive officer is Colonel Patrick Corcoran, phone (703) 697-4645.

 20 MAY 1992
William D. Clark
Principal Deputy
Assistant Secretary of the Army
(Manpower and Reserve Affairs)


JAY M. GARNER
Major General, GS
Assistant Deputy Chief of Staff
for Operations and Plans,
Force Development

APPENDIX C

BIBLIOGRAPHY

DEPARTMENT OF DEFENSE

Department of Defense Publications

Mobility Requirements Study, IAW Section 909, National Defense Appropriation Act 1991 (UNCLASSIFIED)

Defense Planning Guidance, FY 1994-1999, 22 May 1992 (SECRET)

DEPARTMENT OF THE ARMY

Deputy Chief of Staff for Operations and Plans (DCSOPS)

Cadre Division Concept Study, 1 February 1991 (UNCLASSIFIED)

Army Structure Message (ARSTRUC), MAY 1993 (SECRET)

National Guard Bureau

ARNG After Action Report (2 Aug 90-28 Feb 91), 28 June 1991 (UNCLASSIFIED)

US Army War College

The New Military Strategy and Its Impact on the Reserve Components, 7 December 1991 (UNCLASSIFIED)

Can the National Guard Be Ready for Future Mobilizations, 12 November 1973 (UNCLASSIFIED)

The AC/RC Force Mix - Has the Pendulum Swung Too Far, 15 May 1990 (UNCLASSIFIED)

To Provide An Adequate Defense: A Reserve Component Force Structure for the Year 2000, 1 May 1990 (UNCLASSIFIED)

US Army Command and General Staff College

The Reserve Component Dilemma: Mission vs Time, 4 May 1984 (UNCLASSIFIED)

US Army Concepts Analysis Agency (CAA)

Support Requirements Analysis 2001 (SRA-01) (to be published)

The National War College

An Approach to the Army Active/Reserve Force Mix Dilemma for the 1990s and Beyond, March 1985 (UNCLASSIFIED)

Army Reserve Forces: Relationship to the Threat, February 1986
(UNCLASSIFIED)

US Naval War College

Total Army Force Structure for 2010, March 1990 (UNCLASSIFIED)

THE LIBRARY OF CONGRESS

Congressional Research Service (CRS) .

Persian Gulf War: U.S. Reserve Callup and Reliance on the Reserves, CRS Issue Brief, 4 November 1991 (UNCLASSIFIED)

The Mix of United States Active and Reserve Forces, CRS Report 83-196 F,
9 November 1983 (UNCLASSIFIED)

Reserve Components: Partners in the Total Force, 3 April 1989
(UNCLASSIFIED)

US Army Combat-to-Support Ratios: A Framework for Analysis, CRS Report 89-386 F, 26 June 1989 (UNCLASSIFIED)

Persian Gulf War: Defense-Policy Implications for Congress, CRS Report 91-421 F, 15 May 1991 (UNCLASSIFIED)

The Army's Roundout Concept After the Persian Gulf War, CRS Report 91-763 F,
22 October 1991 (UNCLASSIFIED)

APPENDIX D

SAMPLE OUTPUT

D-1. The COMRAD Model creates several data base files for its output. Using standard report building commands, it is easy to produce results in any format. There are two standard output reports which are usually desired: the requirements summary and the functional area summary.

a. The requirements summary captures the manpower totals within the categories into which the model allocates the requirements. The summary categories are:

DAY	The day of the scenario when requirements are needed
RQMT	The total manpower spaces required
AC	The number of spaces allocated to Active Component
RC	The number of spaces allocated to Reserve Component
RISK	The number of spaces within the reserve category which fail the time-to-combat query in the model for this specific day.
NRES	The number of spaces placed in the not resourced category because there are no longer any available manpower spaces in the active and reserve.

An example is seen below:

DAY	RQMT	AC	RC	RISK	NRES
1	11568	10429	0	0	0
16	21931	19193	543	0	0
26	41117	29423	7582	7493	0
36	63214	20764	36129	34750	0
46	53622	12167	36093	29243	0
56	10653	1174	8414	0	0
59	38547	1443	33250	582	0
66	5583	137	4888	0	0
69	9382	721	7723	0	0
76	37243	2696	30823	0	0
79	7737	0	6963	0	0
87	4583	0	4125	0	0
89	10223	968	8232	0	0
96	11484	802	9534	0	0
99	28183	5	25360	0	0
106	30198	168	27010	0	0
109	6270	333	5310	0	0
116	9913	0	8922	0	0
119	10955	328	9532	0	0
121	5779	0	5201	0	0
126	2308	0	2077	0	0
131	177	0	159	0	0
136	2612	0	2351	0	0
139	528	0	475	0	0
149	583	0	525	0	0
154	23618	0	21256	0	0
159	3760	0	3384	0	0
164	4035	0	617	0	3349
169	1350	0	0	0	1350

b. The functional summary gathers the allocation mix for each functional area within the force structure process, e.g. aviation, field artillery, medical, etc. The categories of the report are:

SRC A unique unit type required.

NOMEN The nomenclature for the unit.

RQMT The total number of units required.

AC The number of units of the total allocated to active.

RC The number of units of the total allocated to reserve.

RISK The number of units allocated to reserve which fail the time-to-combat test in the model.

NRES The number of units not resourced due to lack of manpower.

A sample of the output for functional area - Aviation (all SRCs begin with 01).

SRC	NOMEN	RQMT	AC	RC	RISK	NRES
01205L00010	AV BN ASSAULT HELICOPTER(UH-60)	6	1	5	1	0
01246L00010	AV HHC MDM HEL BN	5	1	4	1	0
01247L00010	AV CO MDM HEL	17	3	14	3	0
01265L30010	AV SQ AIR RECON	1	1	0	0	0
01385L10010	AV BN ATK HEL (AH 1)	1	1	0	0	0
01385L20010	AV BN ATK HEL (AH 64)	17	9	8	0	0
01402L00010	AV HHC AVN BDE (CORPS)	4	1	3	1	0
01415L00010	AV BN COMMAND AVIATION (CORPS)	3	1	2	0	0
01422L00010	AV HHD ATS GROUP (THTR)	2	0	2	1	0
01426L00010	AV HHC ATS BN (CORPS)	3	1	2	1	0
01427L10010	AV CO ATS BN (DIV)	11	2	7	2	2
01427L20010	AV CO ATS (AASLT)	1	0	1	1	0
01427L30010	AV CO ATS (CORPS)	3	0	3	1	0
01427L40010	AV CO ATS (THTR)	2	1	1	1	0
01429L00010	AV HQ ATS SPT CO	1	0	1	0	0
01429LPLT10	AV PLT ATS SPT	3	0	3	1	0
01482L00010	AV HHC AVN GRP/REGT	10	3	7	0	0
01547LB0010	AV DET (FW) AEB SUPPORT	3	1	2	1	0
01577LA0010	AV TM AIRCRAFT MAINT(AUG)	2	0	2	0	0
01606L00010	AV HHC THTR AVN BN	2	0	2	1	0
01607L20010	AV CO THEATER	4	0	4	2	0
01832L00010	AV HHC SOF AV REGT	2	1	1	0	0
01833L00010	AV CO ASLT HEL LT	2	1	1	0	0
01834L00010	AV CO ATK HEL LT (SOF)	2	1	1	0	0
01835L00010	AV CO MDM HEL SOF	2	1	1	0	0
01845L00010	AV BN ASSAULT HEL (SOF)	2	1	1	0	0
01855L00010	AV BN SOF AV BN	2	1	1	0	0
01865L00010	AV BN AV SOF	2	1	1	0	0
01946L00010	AV HHC AVIM BN (CORPS)	3	0	3	1	0
01947L10010	AV CO AVIM	2	2	0	0	0
01947L20010	AV CO AVIM FWD	2	0	2	0	0
01947L30010	AV CO AVIM FWD	3	0	3	3	0
01947L60010	AV CO AVIM FWD	1	0	1	1	0
01947L80010	AV CO AVIM FWD	4	0	4	0	0
01966L00010	AV HHC AVIATION MAINT BN (EAC)	2	0	2	1	0
01967L10010	AV CO AVIATION MNT (AVIM) (THTR)	2	0	2	2	0
01967L20010	AV CO AVIATION MNT (AVIM) (THTR)	2	2	0	0	0

APPENDIX E

SPONSOR'S COMMENTS



REPLY TO
ATTENTION OF

DAMO-FDF

DEPARTMENT OF THE ARMY
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
WASHINGTON, DC 20310-0400



16 September 1993

MEMORANDUM FOR DIRECTOR, US ARMY CONCEPTS ANALYSIS AGENCY,
ATTN: CSCA-FE, 8120 WOODMONT AVENUE,
BETHESDA, MD 20814-2797

SUBJECT: Component Requirements and Authorization
Determination (COMRAD) Study Council of Colonels

1. The Draft Component Requirements and Authorization Determination (COMRAD) Study, dated May 1993, was reviewed by the study proponents and selected Army Staff agencies and found to be an acceptable methodology for the determination of component allocation between Active and Reserve Components.
2. The intent of the sponsors to keep this study centered on the below the line forces is evident, and appreciated, through-out the study. The focus of the study is on the TOE force structure with TDA as a given portion of the end strength. COMPOs 2 and 3 together form the "Reserve Component" for the study, which primarily allows for another process to determine which units/organizations should be in the National Guard or Army Reserve.
3. It is the intention of the sponsors to utilize the results of the COMRAD study as a tool during all future Total Army Analysis (TAA). The information derived from this tool will assist the TAA process and allow better resolution of determination factors for alignment of forces into the correct component.
4. Point of contact is LTC Roger W. Todd, (703)697-4582



KEITH L. SKIDMORE
Colonel, GS
Chief, Force Integration and
Modernization Division, ODCSOPS

CF: ASISTANT SECRETARY OF THE ARMY FOR MANPOWER AND RESERVE
AFFAIRS, ATTN: SAMR (MR BARTHOLOMEW), WASHINGTON DC 20310

APPENDIX F
DISTRIBUTION

Addressee	No of copies
Deputy Chief of Staff for Operations and Plans Headquarters, Department of the Army ATTN: DAMO-ZXA Washington, DC 20310	10
Deputy Chief of Staff for Logistics Headquarters, Department of the Army ATTN: DALO-ZXA-A Room 3D572, The Pentagon Washington, DC 20310-0580	2
Deputy Under Secretary of the Army, Operations Research Headquarters, Department of the Army Washington, DC 20310	1
Assistant Secretary of the Army, Manpower and Reserve Affairs Headquarters, Department of the Army ATTN: SAMR-ZB Washington, DC 20310	10
Chief, US Army Reserve Headquarters, Department of the Army ATTN: DAAR-FMF Washington, DC 20310	2
Director, National Guard Bureau Headquarters, Department of the Army ATTN: NGB-ARF Washington, DC 20310	2
CINC Forces Command Force Management Directorate ATTN: FCJ3-Fm Fort McPherson, GA 30330-6000	3

Addressee	No of copies
HQ TRADOC ATTN: ATAN-S Fort Monroe, VA 23651-5143	2
Director US Army Materiel Systems Analysis Activity ATTN: AMXSJ-LM Aberdeen Proving Ground, MD 21005-5071	2
Defense Technical Information Center ATTN: DTIC-FDAC Cameron Station Alexandria, VA 22314-6145	2
USASCAF The Pentagon Library ATTN: JDHQ-LR (Army Studies) Room 1A518, The Pentagon Washington, DC 20310-6000	1
CINC Forces Command Force Capabilities Division ATTN: FCJ5-FC Fort McPherson, GA 30330-6000	1
Commandant US Army War College Operations Group ATTN: AWCM-A Carlisle Barracks, PA 17013-5050	1
President National Defense University ATTN: NDU-LD-CDC Washington, DC 20319-6000	1

Addressee	No of copies
Commandant Armed Forces Staff College ATTN: Library Room B-201 7800 Hampton Blvd Norfolk, VA 23511-6097	1
Commandant US Army Command and General Staff College ATTN: ATZL-SWS-L (Mail) Fort Leavenworth, KS 66027-6900	1
Director Strategic Studies Institute ATTN: AWC Carlisle Barracks, PA 17013-5050	1
Commander Eighth US Army & USFK ATTN: EADJ-T-P APO AP 96205-0010	1
Commander, USAITAC AIAIT-HI, Tech Info Bldg 203, STOP 314 Washington Navy Yard Washington, DC 20374	1
Commander/Director US Army Engineer Studies Center Casey Building, No. 2594 ATTN: ESC-AO (Security Officer) Fort Belvoir, VA 22060-5583	1
Commander in Chief US Army, Europe ATTN: AEAGF-X-A Unit 29351 APO AE 09014	1

Addressee	No of copies
-----------	-----------------

Commander in Chief
US Army, Europe
ATTN: AEAGX-OR
Unit 29351
APO AE 09014

1

Commander
US Army Training and Doctrine Command
ATTN: ATIM-OPM
Fort Monroe, VA 23651-5000

1

Headquarters
US Army Materiel Command
ATTN: AMCPE-AR
5001 Eisenhower Avenue
Alexandria, VA 22333-0001

3

Internal Distribution:

Reference copy:
Unclassified Library

2

Record copy:
Originating office (CSCA-FEF-F)

1

GLOSSARY

1. ABBREVIATIONS, ACRONYMS, AND SHORT TERMS

AC	Active Component
AFPDA	Army Force Planning Data and Assumptions
ARNG	Army National Guard
ASA(MRA)	Assistant Secretary of the Army (Manpower and Reserve Affairs)
CAA	US Army Concepts Analysis Agency
COMPO	component
CSA	Chief of Staff of the Army
DPG	Defense Planning Guidance
FLOT	forward line of own troops
GOSC	General Officer Steering Committee
LOGCAP	logistic capability
NMS	National Military Strategy
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans
POM	Program Objective Memorandum
POMCUS	prepositioning of materiel configured to unit sets
RC	Reserve Component
SRA	Support Requirements Analysis (study)
SRC	standard requirement code
TAA	Total Army Analysis
TAP	The Army Plan
TDA	table(s) of distribution and allowances
TOE	table(s) of organization and equipment
TPFDD	Time-phased Force Deployment Data
TTHS	(active) trainees, transients, holdees, and students
USAR	United States Army Reserve

VCSA Vice Chief of Staff of the Army
WHNSD wartime host nation support direct
WHNSI wartime host nation support indirect

2. TERMS UNIQUE TO THIS STUDY

COMRAD Component Requirements and Authorization Determination
FSRM force structure resource methodology

3. MODELS, ROUTINES, AND SIMULATIONS

CEM The Concepts Evaluation Model is a fully automated, deterministic combat simulation that can simulate months of theater land and air combat.

FASTALS The Force Analysis Simulation of Theater Administrative and Logistic Support Model develops echelon above division support force structure that is balanced, time-phased, and geographically distributed for a specific theater campaign.

4. DEFINITIONS

affordability

The cost of a specific unit type (SRC) in the active force versus in the reserve force.

capability

The assessment of how well a unit can perform its "wartime" mission. Within the TAA process, the capability of like (same SRC) units in the active or reserve is assumed to be the same.

crisis response

The ability to build a force (mix of combat, combat support, and combat service support units) adequate to respond to a military contingency in a timely and effective way.

deployability

The ease with which a unit can be alerted for use in an operation, prepared for movement, and then sent to a location ready to be used. Personnel numbers onhand, equipment status, aircraft and shipping availability, training, and mission all impact on the assessment.

forward presence

The active and/or reserve forces deployed outside the United States

multiple missioning

The identification of a military unit for employment in two or more contingency operations in one or more theaters.

operational priorities

The desired order for units to be made available to meet requirements within a scenario campaign. It depends upon specific unit mission and perceived contribution to overall operation.

peacetime missions

The tasks performed during peacetime by either active or reserve units which are not specifically related to their wartime missions, e.g., forest fire suppression, riot control, disaster relief, etc.

readiness

The assessment of how quickly a unit can be declared fully capable of performing its combat mission. It is dependent on personnel availability, equipment availability, and training along with other measurable elements.

reconstitution

The ability and/or ease to generate large-scale replacements for or within a major conflict.

rotation base

The identification of the minimum number of soldiers in each skill category, rank, or functional area in order to maintain the mandated force structure overseas and within CONUS.

trainability

The assessment of a unit's ability to maintain specific skill proficiency of its soldiers related to the mix of skill within the unit as well as an assessment of the ease of converting a unit from one type to another.

unit manning level

The percentage of personnel in a unit relative to its authorized strength. Also referred to as authorized level of organization (ALO). ALO 1 = 100 percent, ALO 2 = 90 percent, ALO 3 = 80, etc.